

12

EUROPEAN PATENT APPLICATION

21 Application number: 86100368.9

51 Int. Cl.⁴: **F 21 M 7/00**

22 Date of filing: 13.01.86

30 Priority: 15.01.85 US 691806

43 Date of publication of application:
23.07.86 Bulletin 86/30

64 Designated Contracting States:
BE DE FR GB NL

71 Applicant: GTE Products Corporation
100 West 10th Street
Wilmington, DE 19801(US)

72 Inventor: Bergin, John
Route 123 So.
Hancock New Hampshire 03449(US)

72 Inventor: Warren, Bernard
RFD 1 Box 48
Dover Fox Croft Maine 04426(US)

74 Representative: Lemke, Jörg-Michael, Dipl.-Ing.
Wolframstrasse 9
D-8900 Augsburg(DE)

54 Replaceable lamp unit and automobile headlight utilizing same.

57 A lamp unit (10) for being removably positioned within the rear opening (11) of an automobile headlight reflector (13). The unit (10) includes a plastic holder (19), an electric (e.g., tungsten halogen) lamp (30) having a filament structure (42) contained within the envelope (33) thereof, a clamp member (46) secured to the lamp's press-sealed end portion (47), and an insert member (48) located within a cavity (21) of the holder (19). The clamp member (46) includes a pair of

skirt portions (57) which frictional engage and are thereafter secured (e.g., welded) to the innermost surface of an upstanding portion (61) of the insert member (48), thus facilitating alignment and positioning of the lamp (30) relative to the holder (19). The insert member (48) is only partly inserted within the holder's cavity (21) to effect the defined securement and is thereafter attached to the holder.

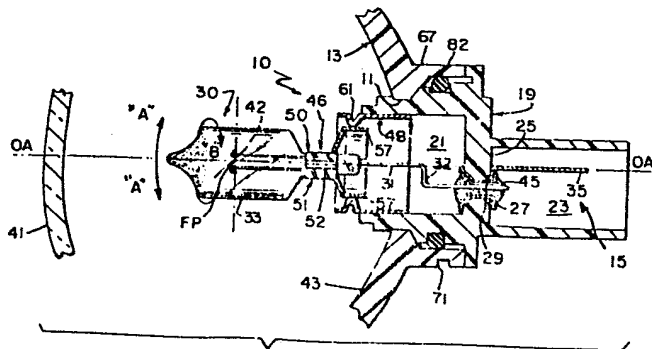


FIG. 2

REPLACEABLE LAMP UNIT AND AUTOMOBILE HEADLIGHT
UTILIZING SAME

TECHNICAL FIELD

5 The invention relates to automobile headlights and more particularly to those wherein a replaceable lamp unit assembly is utilized.

BACKGROUND

10 Automobile headlights wherein a replaceable lamp unit is employed are known in the art. Examples are illustrated in the below-identified patents:

2,423,664	E. RYDER
2,750,491	H.J. ANDERSON
3,593,017	P. CIBIE
3,688,103	H. DAUMULLER
15 3,917,939	H.J. SCHMIDT ET AL
3,987,326	G. LINDAE
4,342,142	Y. NEIDA ET AL
4,344,119	T. BERGOT
4,412,273	P. HELBIG ET AL

20 As stated, the instant invention is related to lamps of the variety described above. In particular, the invention defines a replaceable lamp unit which provides both a hermetic seal for the unit within the headlight's reflector and, equally important, assures that the electric lamp utilized therewith
25 will be maintained in strict alignment as is necessary in

automotive headlights. By the term hermetic seal is meant a seal which prevents the passage of moisture, dust and other elements which can adversely affect the operation of the headlight. By way of example, excessive moisture entering the headlight can adversely affect the reflective coating typically utilized on the concave reflector of the headlight, and thus significantly reduce light output.

In addition to providing a hermetic seal, the replaceable lamp unit defined herein assures that alignment of the electric lamp employed therewith will be maintained. That is, alignment of the glass envelope of the lamp relative to the unit's holder is provided such that the filament structure within the envelope (either a singular coiled filament or two, spaced coiled filaments) will be accurately aligned relative to the optical axis of the reflector when the lamp unit is oriented within the reflector's rear opening. Such alignment is deemed critical to assure optimum headlight output in the direction(s) desired.

As also described herein, a preferred light source which constitutes an important part of the replaceable lamp unit defined herein is an electric lamp of the tungsten halogen variety. One example is shown in U.S. Patent 3,829,719 (Westlund, Jr. et al), said patent assigned to the same assignee as the instant invention. In tungsten halogen lamps, the tungsten which constitutes the filament material is normally evaporated from the filament during lamp operation and combines with the halogen to form a gaseous halide, the halide preventing the tungsten from depositing on the internal wall of the lamp's glass envelope. Upon returning to the filament structure, the halide decomposes, resulting in the deposition of tungsten back onto the filament structure and the release of additional halogen gas to assure continuation of the cycle.

5 The halogen cycle is well known in the art and lamps employing
it have been used for some time. In the case of the two beam
(dual filament) lamp, a typical tungsten halogen lamp provides
about 65 watts when operated at high beam and about 35 watts at
10 low beam. As stated, it is critical that the filament
structure of the lamp within an automobile headlight be aligned
relative to the reflector to provide optimum output of the
finished headlight. As will be described below, such alignment
constitutes an important feature of the replaceable lamp unit
defined herein.

DISCLOSURE OF THE INVENTION

15 It is an object of the instant invention to enhance the
automobile headlight art and, more particularly, to enhance
that portion of the art wherein replaceable units that employ
electric lamps are utilized.

20 It is another object of the invention to provide a
replaceable lamp unit for use within an automobile headlight
which provides a hermetic seal for the electric lamp positioned
therein and also maintains the lamp in a fixed, precisioned
relationship relative to the holder thereof such that the lamp
is precisely oriented relative to the headlight's reflector
when the unit is located therein.

25 It is another object of the invention to provide such a
replaceable lamp unit which can be inexpensively produced in a
manner readily adapted to mass production.

In accordance with one aspect of the invention, there is
defined an improved lamp unit capable of being removably
positioned within the rear opening of a reflector which
constitutes part of an automobile headlight. The lamp unit is

designed for being electrically connected to an external connector which forms part of the electrical circuitry of the automobile. The lamp unit includes an electrically insulative holder defining a cavity therein and an electric lamp positioned within the holder and which includes an envelope having a filament structure therein for being oriented within the reflector when the holder is located within the reflector's rear opening. The lamp unit also includes at least two electrically conductive lead-in wires projecting from the envelope. The improvement comprises a clamp member which is secured about the envelope at a precise location relative to the filament structure and an insert member located at a predetermined distance within the holder's cavity. The clamp member is partly inserted within the insert in contact with an upstanding portion thereof and secured (e.g., welded) to the upstanding portion such that the filament structure will be precisely oriented relative to said reflector.

In accordance with another aspect of the invention, there is defined an improved automobile headlight which includes a concave reflector (glass or plastic) including a rear opening therein, a front lens for directing light emitted from the electric lamp of the headlight and reflected by the reflector, and a lamp unit adapted for being removably positioned within the concave reflector's rear opening. The lamp unit includes an insulative holder for being positioned within the rear opening and defines a cavity therein. The headlight further includes an electric lamp positioned within the holder and including an envelope and at least two electrically conductive lead-in wires projecting from the envelope. The improvement comprises a clamp member which is secured about the envelope at a precise location relative to the filament structure and an insert member located a predetermined distance within the holder's cavity. The clamp member is partly inserted within

the insert and secured (e.g., welded) to an upstanding surface therein such that the filament structure will be precisely oriented relative to the reflector.

BRIEF DESCRIPTION OF THE DRAWINGS

5 FIG. 1 represents an exploded perspective view of the electric lamp, clamp member and insert member of a lamp unit in accordance with a preferred embodiment of the invention;

10 FIG. 2 is a side elevational view, in section, of the lamp unit of the invention and further illustrating the reflector and lens members of a preferred embodiment of an automobile headlight of the invention; and

15 FIG. 3 is a partial, side elevational view on a larger scale of the clamp member and electric lamp of the invention, illustrating particularly the positioning relationship of the clamp member on the sealed end of the electric lamp.

BEST MODE FOR CARRYING OUT THE INVENTION

20 For a better understanding of the present invention, together with other and further objects, advantages and capabilities thereof, reference is made to the following disclosure and appended claims in connection with the above-described drawing.

25 With particular attention to FIG. 1, there is illustrated in a perspective view several components which form part of a lamp unit 10 (FIG. 2) capable of being removably positioned within the rear opening 11 of a reflector 13 which forms part of an automobile headlight. Lamp unit 10 is further designed for being electrically connected to an external connector (not

shown) which comprises part of the electrical circuitry of the automobile using the headlight. Specifically, this external connector is designed for being inserted within the rear portion 15 of unit 10 after unit 10 has been positioned within the reflector's opening. Such a connector typically includes a plurality of electrical wires which also form part of the automobile's circuit. These wires are thus either directly or indirectly connected to the power source (e.g., 6- or 12-volt battery) typically found in most automobiles.

10 Unit 10 includes an electrically insulative holder 19 which defines therein a first cavity 21 and a second cavity 23, said cavities separated by a common wall member 25. Holder 19 is comprised of a heat and impact resistant plastic (e.g., polyphenylene sulfide) and is thus readily suited for use
15 within the relatively harsh environments typically found about automobile headlights.

Unit 10 preferably further includes at least two (only one being shown) electrically conductive members 27 which are each fixedly secured within a respective one of a similar number of
20 apertures 29 (one shown in FIG. 2) located within wall member 25. It is understood that a minimum of two apertures and corresponding electrically conductive members 27 are to be utilized in the instant invention. In the embodiment depicted herein, three members 27 (and apertures 29) are utilized
25 because holder 19 accommodates a dual filament, tungsten halogen lamp 30. Typically, tungsten halogen lamps which include a dual coil filament structure 42 therein (such as shown in FIGS. 1 and 2) in turn include at least four lead-in wires 31 (only one being shown in FIG. 2) which project
30 externally from the glass envelope 33 of the lamp. In the case of a single coil tungsten filament lamp, only two lead-in wires are typically utilized. It is thus understood with regard to

the invention, that holder 19 is adapted for accommodating both single and double coil filament tungsten halogen lamps.

Each of the electrically conductive members 27 is preferably in the form of a conical shaped metal eyelet. A preferred material for each eyelet is tin-plated brass. Other suitable metals include aluminum, copper, steel, and nickel-iron alloy.

Electrically connected to each eyelet is a metallic lug member 35 which includes a base segment positioned firmly against wall 25 and an upstanding leg segment which extends within second cavity 23. Accordingly, each of the lug members 35 (understandably, a total of three are used in the embodiment shown in the drawing) is designed for being inserted within a corresponding opening of the aforementioned external connector to provide electrical connection therewith when the connector is inserted within cavity 23.

As stated, holder 19 is adapted for accommodating an electric lamp 30 which is preferably of the tungsten halogen variety. When in final position within opening 11 of reflector 13, the envelope 33 of lamp 30 extends within the reflector and is substantially surrounded by the reflecting surfaces 43 thereof in such a manner so as to provide optimum light output from the headlight. The headlight further includes the forward lens member 41 secured to reflector 13 and designed for directing light in a predetermined pattern from the assembled unit. Understandably, alignment of envelope 33 and particularly the filament structure 42 contained therein relative to the internal reflective surfaces 43 of reflector 13 such that filament structure 42 is precisely oriented (i.e., centered on) relative to the reflector's optical axis OA-OA and, equally important, the reflector's focal point FP, is deemed critical to assure optimum light output. Accordingly,

it is essential that lamp 30 be initially precisely oriented relative to holder 19 in a fixed relationship therewith such that when the holder is finally positioned within opening 11 this critical alignment is attained. Such precisioned
5 alignment constitutes an important feature of the instant invention, in addition to the provision of the aforementioned hermetic seal.

In FIG. 2, the lead-in wires 31 are shown projecting from envelope 33 into the first cavity 21 of holder 19. Each
10 lead-in wire 31 is shaped such that it will pass through a respective one of the metallic eyelets 27. As shown, each wire includes a substantially centrally located offset segment 32 to enable this positioning. There is thus no need for additional support wires or the like herein. It should also be mentioned
15 that in a dual filament lamp where four lead-in wires are utilized, only three wires are designed to pass through and be connected to a corresponding eyelet. Accordingly, two wires 31 are joined (welded) to serve as a common lead. The arrangement is illustrated clearly in FIG. 1. Attachment of each lead-in
20 wire 31 to a respective one of the conductive eyelets is achieved by soldering such that a quantity of solder 45 flows within the hollow eyelet and effectively surrounds the support wire centrally disposed therein. One example of a suitable solder for use in the invention is a 30/70 tin-lead
25 composition. Other suitable compositions include a 60/40 tin-lead composition, and a 20/80 tin-lead composition. The solder, in addition to providing a sound electrical connection between the eyelet and lead-in wire, also assures the defined hermeticity at this portion of the connection by virtue of its
30 complete filling of the illustrated end portion of the eyelet. It also serves to rigidly maintain the lead-in wire in a fixed

position relative to holder 19 such that the corresponding lamp 30 will be maintained in the substantially fixed position shown. Positive positioning of the lamp is thus assured.

To provide effective connection between the respective lug 5 members 35 and corresponding conductive eyelets 27, a mechanical operation is utilized. Specifically, a projecting end segment of each of the metallic eyelets is crimped over the leg portion of the respective lug member which rests against wall 25. Because the eyelet includes a flange portion at the 10 opposing end thereof (against an opposing surface of wall 25), this crimping operation in effect draws the eyelet positively within the corresponding conical-shaped aperture. The result, therefore, is that a seal is provided between each eyelet and corresponding aperture. The defined crimping operation, as 15 stated, functions to provide the essential electrical connection between lug and eyelet components.

In accordance with the teachings of the instant invention, lamp unit 10 further includes an improved means for providing precisioned alignment of the lamp's envelope (and contained 20 filament structure) within the holder member. More specifically, the invention provides a means for precisely orienting the lamp's envelope in at least three directions relative to the locating surfaces of the holder which align with and engage the reflector when the holder is in final 25 position within the reflector. This three-way orientation prior to final securement of the lamp, including securement of the aforementioned lug and eyelet components, not only assures such precise alignment but, as explained below, is readily adaptable to mass production techniques.

30 To accomplish this, unit 10 includes a clamp member 46 which is secured about the press-sealed end portion 47 of envelope 33 at a precise location relative to the contained filament structure 42. In addition, unit 10 further includes

an insert member 48 which is designed for being partly positioned a predetermined distance within cavity 21 of holder 19. Both member 48 and cavity 21 are of substantially cylindrical shape to facilitate such insertion. In addition, the clamp and insert members are both preferably comprised of steel (i.e., stainless steel), having a thickness of only about 0.016 inch. Clamp member 46 is of two-part construction, comprising two opposing, substantially similar side elements 50 and 51 which, in assembly, are each positioned against an opposing side of the relatively flat end portion 47 such that end tabs 52 thereof become aligned and contact each other. A weld is then performed to connect both opposing pairs of tabs. Precise alignment of each side element is achieved by the provision of two upstanding segments 54 on each opposing side (only two shown in FIG. 1) of sealed end portion 47 and a corresponding number of similarly shaped openings 55 within each side element. Understandably, the upstanding segments, which align with and are inserted within these openings, are precisely located at the time of pressing end portion 47. As is known in the art, press-sealing of a tungsten-halogen lamp envelope typically occurs only after the lamp's filament structure has been inserted to a prescribed depth within the glass tubing which eventually forms the lamp's envelope. This positioning relationship is best illustrated in FIG. 3. It is thus seen that clamp member 46 is accurately located relative to the filament structure 42. As also shown in the drawings, and in particular FIGS. 1 and 3, each part 50, 51 of clamp member 46 includes a skirt portion 57 of substantially semi-circular configuration and designed to be inserted within a large, centrally disposed opening 60 defined by insert 48. Specifically, the outer edge of each skirt engages and slides over the uppermost surface of an upstanding (constricting) portion 61 formed within the outer wall of insert 48 and

projecting therein (within opening 60). Portion 61 extends about the entire inner periphery of insert 48 and is thus also of semi-circular shape to in turn define a smaller diameter opening therein than opening 60. To enable minor contraction of the skirt portions 57 during frictional engagement with upstanding portion 61, a pair of slots 62 are provided by spacing these portions a small distance apart. It is also seen in FIG. 1 that insert 48 has a slot 63 therein to enable minor contraction thereof during positioning within holder 19, thereby facilitating such positioning.

Skirt portion 57 and the outermost surface of portion 61 are both of similar configuration (see especially FIG. 1) to facilitate this engagement and, particularly, to facilitate alignment therebetween. This configuration, as defined, is preferably substantially circular (cylindrical). After initial frictional engagement between these elements, lamp 30 and clamp member 46 are further inserted until filament 42 occupies a predetermined depth. This is considered the first of the aforementioned three directions of orientation. Lamp 30 and clamp member 46 are then moved in a side-to-side direction ("A" in FIG. 2) until the filament structure is substantially centered. Simultaneously with this movement, the envelope 33 may be rotated ("B" in FIG. 2) to precisely orient the coiled filament structure in this manner. At all times, the skirt portions 57 maintain contact with the innermost surface of portion 61. When proper orientation is achieved (i.e., as determined by camera inspection), skirt portions 57 are welded to portion 61 at spaced locations therealong. Laser welders are used because these devices can be accurately aimed and triggered from a distance, thus not interfering with other components of the overall machine which provides assembly of the invention. To enable such usage, the insert member 48 is located within holder 19 such that the upstanding portion 61

protrudes externally of the holder. All welds, preferably three or four at equidistant spacings, are thus achieved externally of holder 19. In addition, such welding occurs only at these locations, there being no further connections or other forms of attachment between the insert and clamp members. This feature significantly reduces production times and associated costs for the invention.

Insert member 48, being metallic, is securedly positioned within the plastic holder 19 using RF induction heating. That is, member 48 is heated to the point that softening of the inner walls of the holder occurs with said material thereafter permanently adhering to the insert. Filament structure 42 has thus been precisely oriented within unit 10 relative to the aforementioned referencing surfaces of holder 19. During this orientation, the three lead-in wires 31 were inserted within the respective eyelets 27 which in turn were only loosely positioned within their respective apertures 29. After all of the above precise aligning has occurred, including fixed securement (welding) of the clamp and insert members, the lug members 35 are then secured to the respective eyelets using a crimping operation. The defined solder 45 is then applied and a substantially assembled unit 10 is ready for insertion within reflector 13.

With further regard to the invention, it is understood that the side-to-side movement of envelope 33 can also include movement toward and away from the viewer in FIG. 2, or various alternative directions if desired, in place of or even in addition to that depicted by arrow "A". It is believed, however, that the extreme precision provided by the invention can be attained with only the three types of movement described above.

5 A significant feature of the instant invention is that not only has precision alignment been achieved in a highly expeditious manner but such alignment is achieved without the need for cement or the like. Curing time for this material would add appreciably to the overall assembly of such a unit. In addition, cements of this type typically outgas at elevated temperatures, such gas possibly adversely affecting the finished product (e.g., by affecting the internal reflective surfaces of the headlight's reflector. The lamp unit of the instant invention overcomes both of these deleterious occurrences.

10 As also shown in FIG. 2, reflector 13 includes a projecting neck portion 67 which extends from the rear portion of the reflector and is located about opening 11 (that is, opening 11 extends through the circumferential neck 67). Located within the exterior surfaces of neck portion 67 is at least one groove 71. To further assist in retaining holder 19 within opening 11, a removable cap member (not shown) is utilized. This cap is adapted for being positioned within (engaging) the corresponding groove 71 and can include a resilient base segment designed for engaging an external surface of holder 19. Such a base segment is preferably resilient to allow flexure thereof during engagement with the holder to prevent lamp misalignment as a result of said engagement. Positioning of holder 19 within reflector 13 is accomplished merely by aligning corresponding slots (not shown) within the external surface of the holder with corresponding male protuberances or the like (not shown) which are spacedly located about the reflector opening 11. Holder 19, having lamp 30 fixedly and precisely positioned therein in the manner defined above, is thus merely inserted within reflector 13 to the depth indicated in FIG. 2. There is thus no need for rotational-type movement

of the holder in order to secure its final position within reflector 13. Thereafter, the aforescribed cap member, preferably including a large central orifice adapted for passing over the exterior surfaces of the rear portion of holder 19, is simply screwed onto the upstanding neck portion 67 of reflector 13. Retention of this cap is preferably assured by provision of an upstanding flange on holder 19. A similar number of projecting segments (not shown) which form part of the cap are designed for passing through various recesses after which the cap is rotated a short distance to effect locking.

To further assure a sound hermetic seal between the exterior surfaces of holder 19 and the corresponding internal surface of opening 11, a rubber O-ring 82 is provided. As shown in FIG. 2, O-ring 82 is positioned within a corresponding groove or slot within the holder's external surface and projects slightly thereabove. Accordingly, a compression fit is provided between the outermost edge of the O-ring and the corresponding internal surfaces of holder 19.

There has thus been shown and described a replaceable lamp unit for use within an automobile headlight wherein the unit provides both a hermetic seal between the electric lamp used therein and the holder, in addition to an effective means of precisely aligning the lamp in fixed relationship to the holder. As shown in FIG. 2, an automobile headlight capable of using replaceable lamp unit 10 includes the concave reflector 13 and the corresponding front lens member 41 which may be sealed to the reflector in any manner known in the art. It is also within the scope of the invention to utilize a reflector and lens which constitute an integral unit, thus eliminating the need for a seal therebetween. Suitable materials for the

reflector and lens are glass and plastic (e.g., polycarbonate). With lamp unit 10 in position within reflector 13, the filament structure of the electric lamp used therein is precisely oriented relative to the reflective surfaces of the reflector, and the focal point and optical axis thereof. Should the lamp fail (burn out), replacement is readily achieved by removing the external connector and retaining cap member, withdrawing the holder and contained lamp, and thereafter directly inserting a new holder-lamp assembly. The retaining cap and external connector are then located in place.

While there have been shown and described what are at present considered the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the invention as defined by the appended claims.

CLAIMS

WHAT IS CLAIMED IS:

1. In a lamp unit for being removably positioned within an opening within the rear portion of an automobile headlight reflector wherein said lamp unit includes an electrically insulative holder for being positioned within said opening and defining a cavity therein and an electric lamp adapted for being positioned within said holder, said lamp including an envelope having a filament structure therein and at least two lead-in wires projecting from said envelope, said filament structure being oriented within said reflector of said automobile headlight when said holder is positioned within said opening, the improvement comprising:
 - a clamp member secured about said envelope of said electric lamp at a precise location relative to said filament structure; and
 - an insert member partly inserted a predetermined distance within said cavity of said insulative holder and defining an opening therein, said insert member having an upstanding portion extending within said opening, said clamp member being positioned within said opening within said insert member in contact with said upstanding portion and fixedly secured only to said upstanding portion such that said filament structure will be oriented within said reflector in a precise manner relative thereto when said insulative holder is positioned within said reflector opening.

2. The improvement according to Claim 1 wherein said clamp member is of two-part construction and said envelope of said electric lamp includes a pressed end portion, said clamp member being secured about said end portion.

5 3. The improvement according to Claim 2 wherein each of said two parts are located about said pressed end portion and thereafter secured to each other.

10 4. The improvement according to Claim 2 wherein said pressed end portion of said envelope includes at least one upstanding segment thereon and said clamp member includes at least one opening therein, said upstanding segment being located within said opening to thereby assist in orienting said clamp member at said precise location relative to said filament structure.

15 5. The improvement according to Claim 4 wherein the number of said upstanding segments and said openings is four, said segments being arranged in pairs of two on opposing sides of said pressed end portion of said envelope.

20 6. The improvement according to Claim 2 wherein each of said parts of said clamp member includes at least one skirt portion, each of said skirt portions providing said contact with said upstanding portion of said insert member and being secured thereto.

7. The improvement according to Claim 6 wherein said insert member is of substantially cylindrical configuration and said upstanding portion is located substantially around the entire internal periphery of said insert member, said skirt portions being fixedly secured to said upstanding portion at spaced locations therealong.

8. The improvement according to Claim 7 wherein the portion of said insert member having said upstanding portion therein is located externally of said cavity within said insulative holder.

9. The improvement according to Claim 7 wherein said skirt portions are secured to said upstanding portion by welding.

10. In an automobile headlight including a concave reflector having an opening within the rear portion thereof, a front lens member for directing light from said headlight in a predetermined manner, and a lamp unit for being removably positioned within said opening of said reflector, said lamp unit including an electrically insulative holder for being positioned within said opening and defining a cavity therein and an electric lamp adapted for being positioned within said holder, said lamp including an envelope having a filament structure therein and at least two lead-in wires projecting from said envelope, said filament structure being oriented within said reflector of said automobile headlight when said holder is positioned within said opening, the improvement comprising:

a clamp member secured about said envelope of said electric lamp at a precise location relative to said filament structure; and

an insert member partly inserted a predetermined distance within said cavity of said insulative holder and defining an opening therein, said insert member having an upstanding portion extending within said opening, said clamp member being
5 positioned within said opening within said insert member in contact with said upstanding portion and fixedly secured only to said upstanding portion such that said filament structure will be oriented within said reflector in a precise manner relative thereto when said insulative holder is positioned
10 within said reflector opening.

11. The improvement according to Claim 10 wherein said clamp member is of two-part construction and said envelope of said electric lamp includes a pressed end portion, said clamp member being secured about said end portion.

15 12. The improvement according to Claim 11 wherein each of said two parts are located about said pressed end portion and thereafter secured to each other.

20 13. The improvement according to Claim 11 wherein said pressed end portion of said envelope includes at least one upstanding segment thereon and said clamp member includes at least one opening therein, said upstanding segment being located within said opening to thereby assist in orienting said clamp member at said precise location relative to said filament structure.

25 14. The improvement according to Claim 13 wherein the number of said upstanding segments and said openings is four, said segments being arranged in pairs of two on opposing sides of said pressed end portion of said envelope.

15. The improvement according to Claim 11 wherein each of said parts of said clamp member includes at least one skirt portion, each of said skirt portions providing said contact with said upstanding portion of said insert member and being
5 secured thereto.

16. The improvement according to Claim 15 wherein said insert member is of substantially cylindrical configuration and said upstanding portion is located substantially around the entire internal periphery of said insert member, said skirt
10 portions being fixedly secured to said upstanding portion at spaced locations therealong.

17. The improvement according to Claim 16 wherein the portion of said insert member having said upstanding portion therein is located externally of said cavity within said
15 insulative holder.

18. The improvement according to Claim 16 wherein said skirt portions are secured to said upstanding portion by welding.

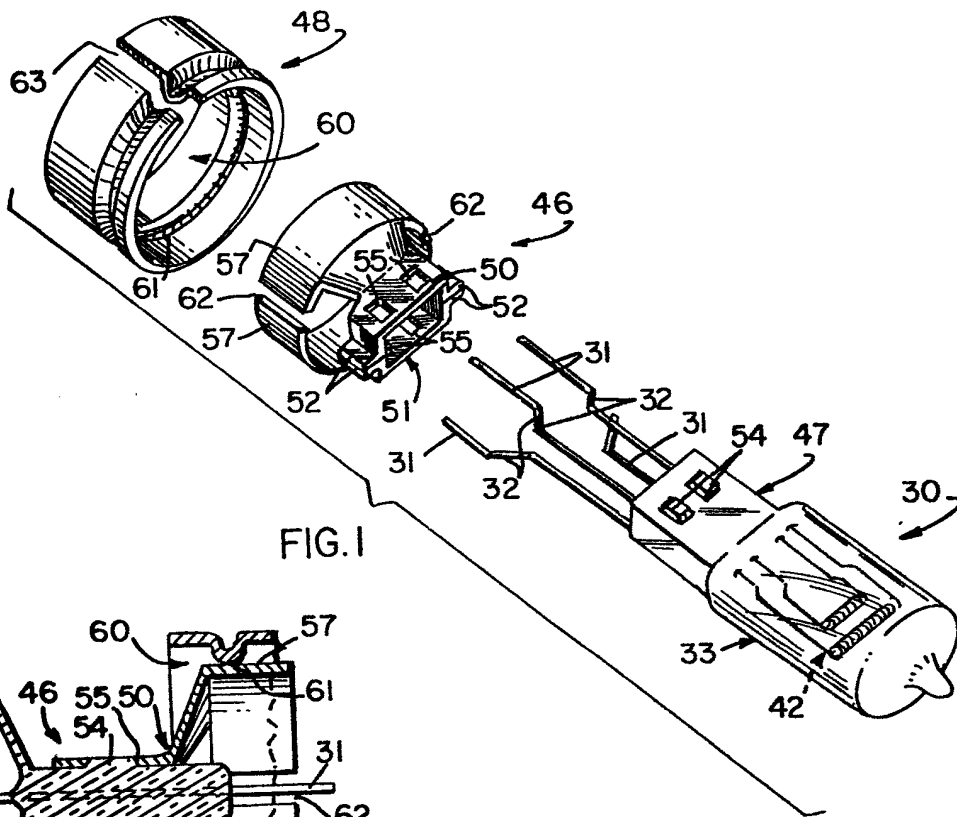


FIG. 1

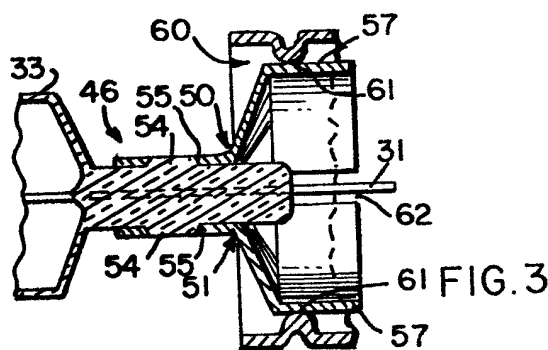


FIG. 3

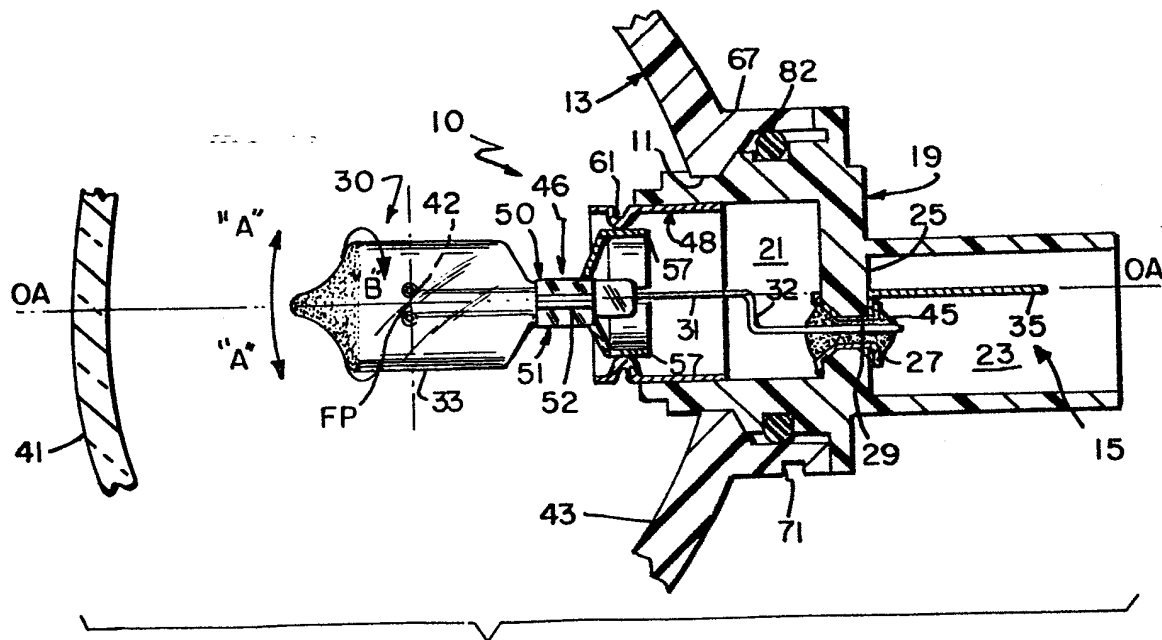


FIG. 2